

CLAIMS

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1. A discharging surface treatment method for generating
a discharge between an electrode and a treatment target so
that a hard coat film is formed on the surface of the treatment
5 target by the discharging energy,

wherein a powder that is formed by a simple substance
or a combination of a plurality of carbides of metals
belonging to the IVa, Va and VIa families in the Periodic
Table is mixed with a ferrous-family metal powder or
10 non-ferrous metal powder having the same composition as the
treatment target as a simple substance or a combination of
a plurality of metals, and this is compressed and molded,
and then preliminarily sintered to form a sintered electrode
serving as a discharge processing electrode, and

15 electrical conditions at the time when the base member
of the treatment target is directly subjected to a
discharging surface treatment and the electrical conditions
at the time when a hard coat film that has been formed is
subjected to a discharging surface treatment are altered
20 according to the characteristics of the treatment target
material.

2. A discharging surface treatment method for generating
a discharge between an electrode and a treatment target so
25 that a hard coat film is formed on the surface of the treatment

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target by the discharging energy,

wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then preliminarily sintered to form a sintered electrode serving as a discharge processing electrode, and

electrical conditions at the time when a hard coat film that has been formed is subjected to a discharging surface treatment are altered at least once according to the characteristics of the treatment target material.

3. A discharging surface treatment method for generating a discharge between an electrode and a treatment target so that a hard coat film is formed on the surface of the treatment target by the discharging energy,

wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of

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1 a plurality of metals, and this is compressed and molded,
 2 and then preliminarily sintered to form a sintered electrode
 3 serving as a discharge processing electrode, and

4 electrical conditions at the time when the base member
 5 of the treatment target is directly subjected to a
 6 discharging surface treatment and the electrical conditions
 7 at the time when a hard coat film that has been formed is
 8 subjected to a discharging surface treatment are altered
 9 according to the characteristics of the treatment target
 10 material, while the electrical conditions at the time when
 11 the hard coat film that has been formed is subjected to a
 12 discharging surface treatment are altered at least once
 13 according to the characteristics of the treatment target
 14 material.

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16 4. The discharging surface treatment method according
 17 to claim 1, wherein an inert gas is interpolated between
 18 the sintered electrode and the treatment target.

19 20 5. The discharging surface treatment method according
 20 to claim 2, wherein an inert gas is interpolated between
 21 the sintered electrode and the treatment target.

22 6. The discharging surface treatment method according
 23 25 to claim 3, wherein an inert gas is interpolated between

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the sintered electrode and the treatment target.

7. The discharging surface treatment method according to claim 1, wherein the sintered electrode is allowed to scan the treatment target so that the hard coat film is formed on the surface of the treatment target.

8. The discharging surface treatment method according to claim 2, wherein the sintered electrode is allowed to scan the treatment target so that the hard coat film is formed on the surface of the treatment target.

9. The discharging surface treatment method according to claim 3, wherein the sintered electrode is allowed to scan the treatment target so that the hard coat film is formed on the surface of the treatment target.

10. A discharging surface treatment device for generating a discharge between an electrode and a treatment target so that a hard coat film is formed on the surface of the treatment target by the discharging energy,

wherein a powder that is formed by a simple substance or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or

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Fig. 33

non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of a plurality of metals, and this is compressed and molded, and then preliminarily sintered to form a sintered electrode
5 serving as a discharge processing electrode, and

said discharging surface treatment device is provided with a switching unit which alters the electrical conditions at the time when the base member of the treatment target is directly subjected to a discharging surface treatment
10 and the electrical conditions at the time when a hard coat film that has been formed is subjected to a discharging surface treatment according to the characteristics of the treatment target material.

11. A discharging surface treatment device for generating a discharge between an electrode and a treatment target so that a hard coat film is formed on the surface of the treatment target by the discharging energy,

wherein a powder that is formed by a simple substance
20 or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of
25 a plurality of metals, and this is compressed and molded,

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73 and then preliminarily sintered to form a sintered electrode serving as a discharge processing electrode, and

5 said discharging surface treatment device is provided with a switching unit which alters the electrical conditions at the time when a hard coat film that has been formed is subjected to a discharging surface treatment at least once according to the characteristics of the treatment target material.

10 12. A discharging surface treatment device for generating a discharge between an electrode and a treatment target so that a hard coat film is formed on the surface of the treatment target by the discharging energy,

B" wherein a powder that is formed by a simple substance
15 or a combination of a plurality of carbides of metals belonging to the IVa, Va and VIa families in the Periodic Table is mixed with a ferrous-family metal powder or non-ferrous metal powder having the same composition as the treatment target as a simple substance or a combination of
20 a plurality of metals, and this is compressed and molded, and then preliminarily sintered to form a sintered electrode serving as a discharge processing electrode, and

25 said discharging surface treatment device is provided with a first switching unit which alters the electrical conditions at the time when the base member of the treatment

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target is directly subjected to a discharging surface treatment and the electrical conditions at the time when a hard coat film that has been formed is subjected to a discharging surface treatment according to the characteristics of the treatment target material, and a second switching unit which alters the electrical conditions at the time when the hard coat film that has been formed is subjected to a discharging surface treatment at least once according to the characteristics of the treatment target material.

13. The discharging surface treatment device according to claim 10, wherein an inert-gas supplying unit is installed so as to interpolate an inert gas between the sintered electrode and the treatment target.

14. The discharging surface treatment device according to claim 11, wherein an inert-gas supplying unit is installed so as to interpolate an inert gas between the sintered electrode and the treatment target.

15. The discharging surface treatment device according to claim 12, wherein an inert-gas supplying unit is installed so as to interpolate an inert gas between the sintered electrode and the treatment target.

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16. The discharging surface treatment device according to claim 10, wherein an X-axis driving device, a Y-axis driving device and a Z-axis driving device, which relatively shift the sintered electrode and the treatment target in the X-direction, Y-direction and Z-direction, are installed so that the X-axis driving device, the Y-axis driving device and the Z-axis driving device allow the sintered electrode to scan the treatment target to form the hard coat film on the surface of the treatment target.

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17. The discharging surface treatment device according to claim 11, wherein an X-axis driving device, a Y-axis driving device and a Z-axis driving device, which relatively shift the sintered electrode and the treatment target in the X-direction, Y-direction and Z-direction, are installed so that the X-axis driving device, the Y-axis driving device and the Z-axis driving device allow the sintered electrode to scan the treatment target to form the hard coat film on the surface of the treatment target.

18. The discharging surface treatment device according to claim 12, wherein an X-axis driving device, a Y-axis driving device and a Z-axis driving device, which relatively shift the sintered electrode and the treatment target in

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the X-direction, Y-direction and Z-direction, are installed so that the X-axis driving device, the Y-axis driving device and the Z-axis driving device allow the sintered electrode to scan the treatment target to form the hard coat film on
5 the surface of the treatment target.

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